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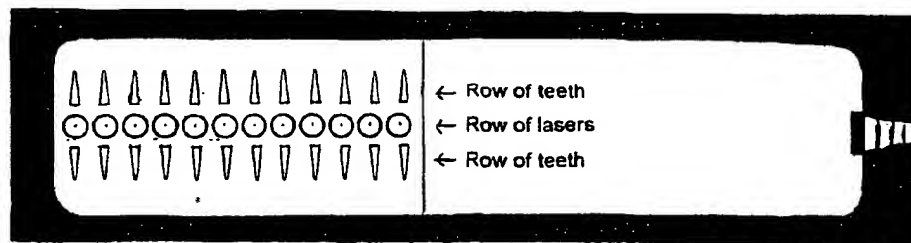
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: IMPROVED LASER COMB DESIGN/FUNCTION

Actual size 180mm (diagram reduced)



BELOW

(57) Abstract: A hand-held, comb-like device emitting laser beams from laser diodes set in a row centered between two parallel rows of teeth for parting hair, enabling more economical product manufacturing as well as a more effective way of irradiating hair-growing skin with laser energy than that afforded by conventional hand-held laser devices where the laser energy is conveyed via a system of fiber optics into and through tubes which must also act as teeth for parting hair.

WO 01/60457 A1

IMPROVED LASER COMB DESIGN/FUNCTION

A hand-held, comb-like device emitting laser beams from laser diodes set in a row centered between two parallel rows of teeth for parting hair, enabling more economical product manufacturing as well as a more effective way of irradiating hair-growing skin with laser energy than that
5 afforded by conventional hand-held laser devices where the laser energy is conveyed via a system of fiber optics into and through tubes which must also act as teeth for parting hair.

Low-power laser is in widespread use in skin care, scar reduction, wound healing and the like, and has also been found to assist the hair's natural
10 ongoing replacement and improve its condition. However, when there is existing hair growth on the skin being treated (for whatever purpose), laser beams by themselves do not satisfactorily penetrate the hair and it is necessary to find means to enable the laser beam or beams to be better brought into contact with the hair-growing skin.

15 In this invention laser energy reaches the hair-growing skin by way of a row of laser beams being preceded by a row of teeth that part the hair to expose the skin in advance of said row of laser beams. Said laser irradiation is thus direct in its action instead of as is done via the unnecessarily complex conventional system which uses tubes, each one
20 containing a fiber optic to both carry the laser light and part the hair, requiring said tubes to be broader than the teeth of this invention which are solid and can be finer and more sharply pointed and plow-like in shape and function, affording more effective hair parting than that of aforesaid conventional system.

25 This invention will now be described with reference to the accompanying drawings which show internal details which are encased in the device.
(See fig.1 , fig.1a, fig.1b, fig.1c.)

In this device solid state diode lasers are used. The diodes usually come from the manufacturer within complete modules which are small
30 cylindrical units each approximately 20mm long by 6mm in diameter in

which is encased the lasing medium which creates the laser beam and the electronics that control and process the electric current that passes through the lasing medium.

The lasing medium chosen for use in the preferred form of this invention
35 produces a visible red beam of between 632 to 670 nanometers and has a typical divergence of 33 degrees in the perpendicular plane and 7 degrees in the parallel plane, said angles varying slightly according to different manufacturers' diode module construction. A lens is positioned in front of each diode at or near the point of exit of the laser beam to
40 columnate said laser beam so as to control its divergence from its point of exit.

Another feature of this invention is its two rows of teeth which are provided in this device so that the aforesaid function of parting the hair is conveniently effected whether the device is moved in either a forward or
45 backward direction across the skin.

This invention has been described by way of example only and it should be appreciated that modifications and improvements may be made without departing from the scope and spirit thereof. For example, the above description of the invention refers to a preferred laser diode
50 frequency but other frequencies such as the infrared wavelength may be used. Also, a single laser diode may be used and divided into separate beam parts deflected in a configuration similar to that emitted from a row of separate diodes as described in the foregoing. Also, in addition to the comb-like configuration described in the foregoing (where the row of
55 lasers and combs are parallel to the body of the device) other configurations such as a rake-like one (where the row of lasers and teeth are at right-angles to the body of the device) or a brush-like one are possible. Modification of the device from mains power to battery power usage is also possible.

What is claimed is:

1. A laser comb of improved design/function for irradiating hair-growing skin, comprising:
 - A radiation source, and a power source for said radiation source;
 - A hand-held case enclosing a row of lasers emitting a row of laser beams or a single laser the beam of which is divided into a number of emitted beams;
 - Said row of laser beams being preceded by teeth that part the hair in advance of said row of laser beams;
 - Two rows of teeth – one on each side of the row of said laser beams enabling parting of the hair with said laser comb whether it is moved in either a forward or backward direction across the skin.

1/1

PERSPECTIVE:

Note: the two rows of teeth cannot be seen from this angle.

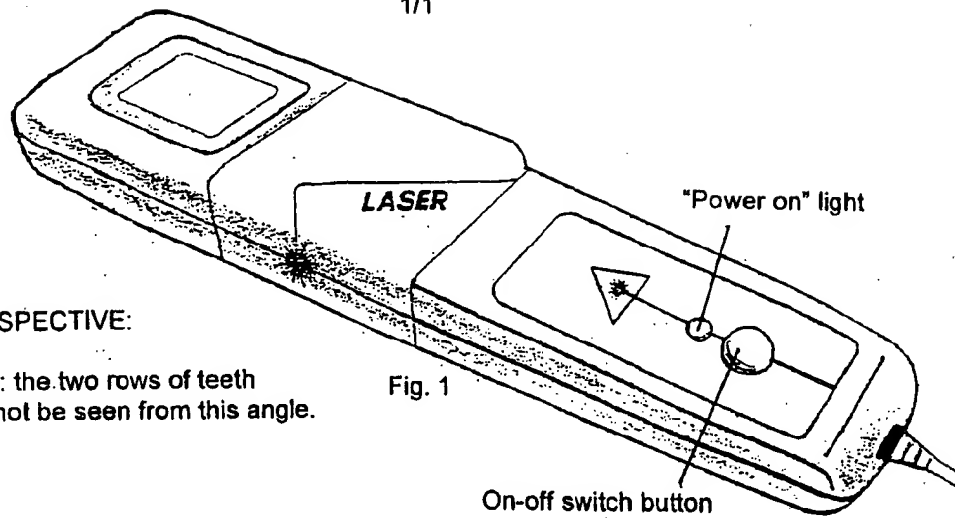


Fig. 1

SIDE

Fig. 1a

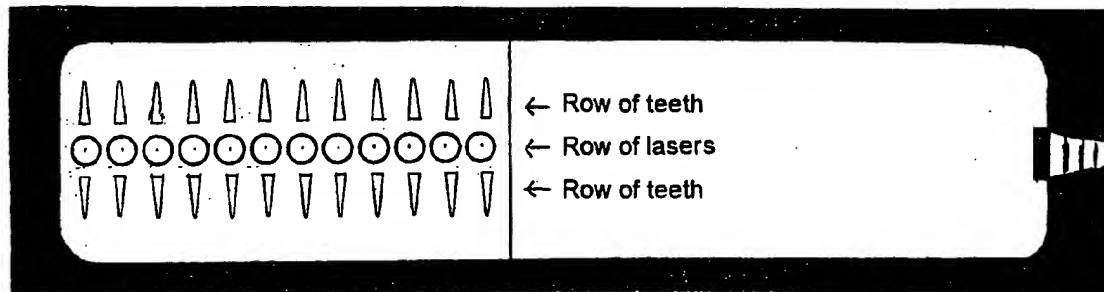
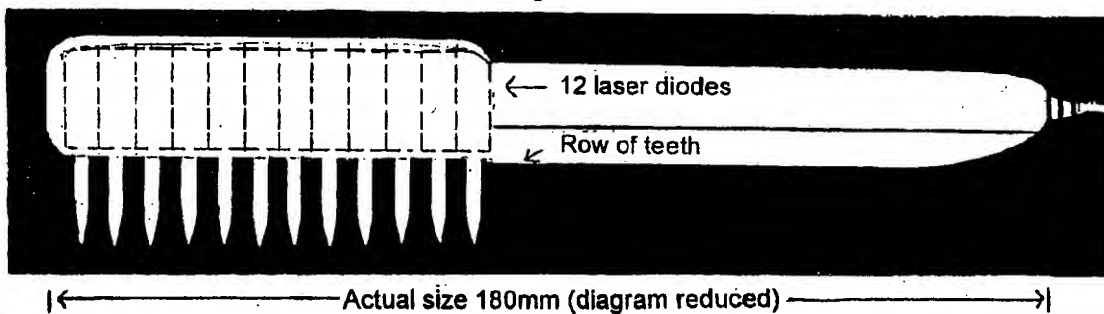


Fig. 1b

BELOW

FRONT

Laser →

Two rows of teeth →

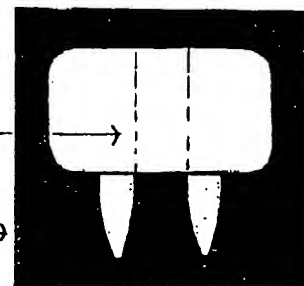


Fig. 1c

INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER		
Int. Cl. ⁷ : A61N 5/067		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols) IPC A61N 5/06, 5/067		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) WPAT: (brush+ or comb? or combing) and (laser+ or light or illuminat+ or irradiat+ or radiat+)		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X,Y	DE 3336939 A (SAALMANN) 25 April 1985 Page 7 line 9 - page 9 line 4, Figures 1-3	1
Y	DE 3511281 A (SAALMANN) 10 April 1986 Page 7 line 19 - page 8 line 23, Figure 1	1
A	FR 2518412 A (LAGUERRE) 24 June 1983	1
<input type="checkbox"/> Further documents are listed in the continuation of Box C <input checked="" type="checkbox"/> See patent family annex		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search 18 April 2000		Date of mailing of the international search report - 8 MAY 2000
Name and mailing address of the ISA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaustalia.gov.au Facsimile No. (02) 6285 3929		Authorized officer <i>M. C. Kraefft</i> M.G. KRAEFFT Telephone No : (02) 6283 2455

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/AU00/00302

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member			
DE	3336939	AT	35909	EP	139278
DE	3511281	AT	35909	EP	139278
					END OF ANNEX